

**KEYBOARD TUTORIAL  
TURTLE GRAPHICS  
HOME ACCOUNTING**

**3 FREE**

**SOFTWARE TITLES ENCLOSED**

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# KEYBOARD TUTORIAL TURTLE GRAPHICS HOME ACCOUNTING

## KEYBOARD TUTORIAL

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Here is a program to help you become familiar with the keyboard of the Timex Sinclair 2000. Learn how the various "control" keys allow you to use the different functions available on each key.

There is a practice section that drills you on obtaining different letters, symbols, and keywords. Repeat it as often as you like, for as long as you like. Each "question" is selected at random, and each "quiz" will be different.

### TO LOAD THE PROGRAM:

First, be sure your cassette recorder is connected to the computer, EAR to EAR. Put the cassette in the recorder, press REWIND to be sure it is fully rewound.

Next, press LOAD (when you first turn the computer on, either the copyright notice or the flashing K cursor is on the screen, pressing the J key will print LOAD on the screen).

Hold the SYMBL SHIFT key down while pressing the P key twice. This gives you two sets of quotation marks, and the screen will look like this:

LOAD ""

Start the cassette recorder, by pressing the PLAY key, and press the computer's ENTER key.

Chapter Four in your manual has more detail on LOADING.

**NOTE:** Use the counter on your cassette recorder (if it has one) to easily find the parts of the Keyboard Tutorial (for instance, locating the drill segment) or the beginning of the other two program on this tape. Set it to 00, note the name of each program you load as it appears on the screen and its location according to your counter.

For example, when loading the first part of Keyboard Tutorial, the screen will show

Program: ttype

when the computer finds the beginning of it. Note the numbers on your tape counter when this appears.

### TO USE THE PROGRAM:

Stop the tape when the first "screen" of the program appears. It is in position to load the next segment when you are ready for it.

The computer will guide you through an introduction of the keyboard. All you need do is follow the instructions appearing on the screen. Usually, those instructions will simply be

(Press k to cont. - z to copy)

When you've had time to review the information on the screen, press the k key to continue. The key you are asked to press to continue will change with each screen. This gives you practice at locating the different keys.

If you have a printer connected to the computer, you can press the z key (notice the keyword COPY is on that key), and the information on the screen is printed on paper. Press k to continue. You may copy each screen before going on to the next and have a "hard copy" of the entire Tutorial.

When you've completed the entire lesson, you'll be invited to

PRESS r TO REVIEW THIS SECTION

PRESS 2 TO LOAD PART 2

If you press 2, the screen will tell you to

START THE TAPE TO LOAD PART 2

When Part 2 has loaded, the computer will tell you to

STOP THE TAPE

and you will then proceed through Part 2 the same as Part 1. At the end of Part 2, you'll have the choice between reviewing the section or going on to the next one.

When you reach the practice session, you'll be given the instruction to

STOP THE PRACTICE SESSION, PRESS X

During the practice session, you are told which cursor is on the screen and asked to PRESS a specific keyword, function or character. To do this, you must press the correct key(s). For example, if you are asked to

PRESS T

and the cursor mode is assumed to be C, you need only press the T key. But if the cursor mode is stated as L, you need to press CAPS SHIFT T for the correct answer.

If you need Extended Mode, obtain it before pressing the appropriate key. If not, reminders appear on the screen. You will not be told your answer was incorrect.

If you want to repeat the practice session at some future time, without going through the first three parts of the Tutorial, you can either

1. Start the tape at the beginning, after pressing

LOAD "keys4" ENTER

The computer will bypass the first three parts of the program (putting their LOAD names on the screen as they go by) and LOAD the practice session. This takes some time, so you can

2. Start the tape before, but as near to, the location of the practice session, and press LOAD "instruction." (You must guess at the location if you don't have a tape counter.)

## TURTLE GRAPHICS

Turtle Graphics helps you learn about programming in a "language" different than BASIC, while creating pictures on your screen. You draw by moving an imaginary "turtle" around the screen; its trail is the line you are drawing.

You may save, change ("edit"), and reuse the "program" made up of the commands you gave the computer while creating your artwork.

Let's do a sample drawing. Then we'll provide a complete list of the commands you can work with in Turtle Graphics.

### TO LOAD THE PROGRAM:

If you are at the proper location on the tape (you've just finished the Keyboard Tutorial or have reset the tape with a counter), press

```
LOAD ""  ENTER
```

and start the recorder in PLAY mode.

If you are not sure where to find the program, start the tape at the beginning (or a location before the program), after pressing

```
LOAD "play"  ENTER
```

When the program has loaded, you'll see a black screen with a blue border and, if you look closely, a white dot — your "turtle" — in the center of the screen. STOP THE TAPE.

When the program starts, the turtle is facing the top of the screen. To make it move — and leave a line — ten spaces (called "pixels," or picture elements) — in the direction it is facing, type

```
fd10
```

(for "forward 10"), and press

```
ENTER
```

Suppose we want to draw a box. We have to turn the turtle, either left or right, 90 degrees, for a square corner. Type

```
lf90  ENTER
```

You didn't see the turtle turn, but it did. Then type

```
fd10  ENTER
```

(If you make a typing mistake any time before pressing ENTER, you can use the DELETE key — CAPS SHIFT 0 — to erase it. Once you've pressed ENTER, you'll have to use the editor, which we discuss below, to make corrections.)

To finish the square, enter the following commands

```
lf90  ENTER
fd10  ENTER
lf90  ENTER
fd10  ENTER
```

You now have a complete square on the screen.

Now comes the best part. To draw another square, you don't have to repeat the sequence. Type

```
mv12  ENTER
```

This moves the turtle without drawing a line. Notice the turtle is now to the right of the square. Turn it so it's facing up again, the way we started the program, by typing

```
lf90  ENTER
```

and then type

```
do2   ENTER
```

Two more squares have appeared on the screen! The do command tells the computer to do something as many times as the number you put after it. Try it again:

```
do5 ENTER
```

#### THE EDITOR:

How does the computer remember what to do? It saves the program, as you write it. You can look at — and change — the program, by calling on the editor. Type

```
ed ENTER
```

There is your program, as you typed it. You can use other commands to work with the editor. Notice the white square next to the first line of your program. Press ENTER, and it moves to the second line. Press ENTER, over and over; eventually, it passes the last line of the program goes to the last line of the screen and appears at the top.

After you've moved the cursor down the screen and back to the first line, press ENTER until you reach the line that reads

```
mv12
```

Press

```
c ENTER
```

to change the line. Then press

```
mv20 ENTER
```

and the line changes. Press ENTER to move the cursor to the next line, then press

```
c ENTER
```

and then ENTER again. This time, the change erases the line. To return to the drawing screen, press

```
en ENTER
```

To see the results of the altered program press

```
do4 ENTER
```

due to the changes in the second-to-last line, the squares are farther apart. We eliminated the last line, the turtle didn't make the last turn. Instead of starting each square facing upward, it started each square facing the same direction it finished in.

#### ADDITIONAL COMMANDS:

You can clear the screen by typing

```
cl ENTER
```

The program is still in the computer; prove it by typing

```
do2 ENTER
```

You can erase the program from the computer's memory by typing

er                    ENTER

Clear the screen again (cl ENTER), and you're back to the starting point. Let's illustrate a few more commands with another sample program.

You move the starting point for the turtle (the point at which it starts its next move) by changing its location on the axis (across the screen) or the y axis (up/down the screen).

nx0 is the left edge of the screen, nx255 is the right edge.

ny0 is the bottom of the screen, ny175 is the top

You must move the turtle after resetting either or both coordinates by typing

or                    ENTER

As we've seen, the computer will save your instructions, in order. You may direct it to execute commands, but not save them.

ns                    means don't save the instructions that follow, until

sv                    tells the computer to begin saving again

Here's an example program. (Press ENTER after each command:

```
ns                    (don't save next steps)
ny20                (set new y-coordinate, to 20)
or                    (move turtle to new origin)
sv                    (start saving the following steps)
fd130                (move forward 130 pixels)
rt174                (turn right 174 degrees)
do60                (do all this 60 times)
```

The do command is not saved as part of the program. After you've finished the program, look into the editor (ed) to see what was saved, return to the screen (en) and try a different pattern by using a different number after do. Try editing the program, as we did above, using different numbers after rt.

If you draw a line that is too long for the screen, it will "wrap around." That is, it will re-enter the screen directly opposite the place it went off, and continue until it reaches the length you specified.

You can't erase a line while working on the screen, but you can by entering the editor and changing or eliminating the appropriate program line.

Try changing the ink color with ic, the paper color with pc, or the border color with bc, followed by the number key of the color you want.

If you have a printer, you can save your screen designs by pressing

cp                    ENTER

You can print the program stored in the computer on the printer by pressing

pg                    ENTER

Instead of using lf or rt and a number of degrees to make a turn, you can type

dr                    and a number of degrees from 0-360

The turn will be made when you press ENTER. To choose the direction of your turn, use 0 for straight up, 90 to face the right edge of the screen, 180 straight down, and 270 the left edge.

While editing, moving the cursor to the line below the last line of the program and pressing

a            ENTER

enables you to add lines at the end of the program. When you finish adding instructions press ENTER. You may now return to the drawing screen with

en            ENTER

If a program is too long to fit on one screen, use a second and a third (three is the limit). While in the editor, typing

p            ENTER

changes to the next "page" (back to the first if you are on number 3).

#### WHAT TO DO IF THE PROGRAM STOPS

If the program should stop with a report code across the bottom, pressing

GOTO 1	ENTER	restarts from scratch
GOTO 10	ENTER	clears the screen and restarts with the turtle at your last chosen origin
GOTO 30	ENTER	lets you resume with the design intact on the screen and the turtle in its last position

To stop the program, type

en            ENTER

while in drawing mode. If you stop the program by mistake, you can resume with the GOTO commands above.

#### THE TURTLE GRAPHICS COMMANDS (xx = a number)

##### Drawing Screen

fdxx	=	draw line forward xx pixels
mvxx	=	move xx pixels but don't draw
lfix	=	turn left xx degrees
rtxx	=	turn right xx degrees
drxx	=	turn to xx degrees
nxxx	=	new x coordinate
nyxx	=	new y coordinate
or	=	move turtle to new origin
inxx	=	increment line length by xx pixels
ns	=	do not save next commands
sv	=	save next commands
cp	=	copy screen to printer
pg	=	print program on printer
cl	=	clear screen
er	=	erase program
pcxx	=	set paper color
icxx	=	set ink color
bcxx	=	set border color



doxx = execute saved commands xx times  
 ed = go to editor  
 en = stop program

#### Editor

ENTER = cursor to next line  
 c = change line  
 a = add lines at end  
 p = move to next page  
 en = return to drawing screen

## HOME ACCOUNTING

Here's a program to help you keep track of your household budget, your business records, or both! It allows you to enter budget figures in advance, actual amounts spent monthly as they occur, and changes whenever you wish.

You can check the month-by-month progress of your individual budget accounts or your total budget, in columns of figures or on bar graphs. You can print the results on paper if you have a printer, and save the budget on a tape cassette for periodic updating and review.

#### TO LOAD:

With the tape at the proper position, before the start of the program, you can press LOAD "" ENTER; or, start the tape from the beginning (or some point before the program begins) and press

LOAD "budge" ENTER

Start your cassette recorder in PLAY mode. STOP the tape when the program finishes loading and the first screen appears.

#### TO USE:

The first screen shows the layout the program uses: a top window for choosing functions, a middle window in which the names of your files will be placed (such as Electric, Food, Gasoline, etc.), and a lower window in which you will record budget and actual figures for each month.

At the top of the screen are three function choices. The first one, SAVE, is printed in inverse characters — white on black. This serves as a "cursor" to let you know which choice will be activated if you press ENTER. Press the 8 key (in this program, you need not press CAPS SHIFT to get the arrows above the keys) and the second entry, LOAD, will be inverted. Press the 8 key again, DONE is inverted. Press ENTER.

#### THE MAIN MENU:

This will produce a new line of choices in the top window:

FILES NAMES VALUES REVIEW GRAPH DONE

This is the main menu, from which you "call" other functions. Use the various commands and functions in different ways and in different orders once you have initially created your files. At first, the only useful choice is VALUES. Press the 8 key twice, until VALUES is inverted, press ENTER.

**VALUES:**

Now the top window gives you the choice of

**NEWACCT CHANGE SCROLL DONE**

Let's start with **NEWACCT**. Press **ENTER** to begin a new account.

A "prompt" appears at the bottom of the screen, asking for an **ACCOUNT NAME**. At the same time, an arrow points to the top line of the middle window. Type in the name of the first account you wish to enter, perhaps **MORTGAGE**. (You may use all lower case letters, capital first letters — using **CAPS SHIFT** — and lower case, or press **CAPS LOCK** — **CAPS SHIFT 2**, changing the flashing cursor after the prompt from **L** to **C** — and work with all capitals for all your labels, while still being able to use the number keys.)

If you make a typing error, and realize it before you press **ENTER**, you can use **DELETE (CAPS SHIFT 0)** to erase. Then type in the correct letters. If you **ENTER** a mistake, use the **CHANGE** function (discussed later) to repair it.

When you type in the account name and press **ENTER**, the name will appear on the top line of the middle window. You'll then be prompted for the **BUDGET FOR JAN(uary)** amount. Fill it in, in dollar amounts (no dollar signs and no cents after a decimal point please). Now fill in, in response to the prompt, the **ACTUAL FOR JAN** amount. At this time, you may enter **0** and change it later if you don't have an actual amount available.

Notice the computer is automatically calculating and showing the **DIFFERENCE**, plus or minus, between your budgeted and actual amounts. Don't worry about this if you are entering zeroes in the **ACTUAL** column; the program will recalculate the **DIFF** when you enter your actual figures later.

The **NEWACCT** label will flash as you enter the data for a new account.

When you've entered the last figure — **DECember ACTUAL** — the screen will return to its "ready" state, with the cursor (inverse letters) still at **NEWACCT**.

Any time you wish a printout of the current displayed set of windows, press the break key & **CAPS SHIFT** simultaneously. The word **COPY?** will appear on the bottom of the display. Answer **Y** or **N**. This will work at any time for any window configuration.

**THIS IS IMPORTANT**. If you press **ENTER** now, you erase your first account as you write a new one. First, you must scroll the account you've just entered into the computer's memory and, in effect, turn to a new blank page for another new account.

Use the **8** key to scroll the cursor. Press **ENTER**. Press the **6** (down arrow) key once to set the arrow pointer at a new blank line. (Press the **7** key and return the first name to the top line on the screen, just to show that it's still there, then press **6** again.) Press **ENTER** again.

**THEN**, with the cursor automatically returned to **NEWACCT**, press **ENTER** to begin a new account.

Fill in as many accounts as you like. And, of course, if you think of additional accounts at a later date, you can always add them.

To make changes in a file, go through the steps above to move from the **SAVE LOAD DONE** screen (entering **DONE**) through the **FILES NAMES VALUES REVIEW GRAPH DONE** screen (entering **VALUES**) to the **NEWACCT CHANGE SCROLL DONE** screen — where we already are in these instructions.

Use the **CHANGE** function to adjust budget amounts or to fill in actual amounts

as they become available. First, move the cursor to SCROLL, press ENTER, use the 6 and 7 arrow keys to get the account you wish to work with on the top line in the middle window. When you press ENTER, the figures you've already filled in for that account will appear in the bottom window.

Move the cursor to CHANGE and press ENTER. As CHANGE starts flashing, a blue cursor appears over JAN. Move the cursor, again with the 6 and 7 keys, to the month you wish to change. Press EDIT, the 1 key. A prompt at the bottom of the screen will show BUDGET for that month, with the current amount in parentheses. If you wish to leave the amount unchanged, press ENTER.

Next, the prompt will be for ACTUAL. Again, the current amount will be shown. To make a change, type in the correct amount and press ENTER. You may move the cursor to another month and press EDIT again or return to the menu in the top window by pressing ENTER.

When you are through entering new or changed values for your accounts, move the cursor to DONE and press ENTER. You'll be back to the main menu. Let's look at the other choices.

#### FILES:

If you press ENTER while the cursor is on FILES, you'll be given a choice of

SAVE — to save the program with all its data, on cassette tape, under a name you'll supply.

LOAD — to reLOAD a file, using the same name.

DONE — to return to the main menu.

#### NAMES:

Pressing ENTER with the cursor on NAMES produces the following choices in the top window:

CHANGE — to change the account name in the middle window. You may have entered a spelling error, or wish to change the name by which you call an account.

BLANK — deletes the entire account in the middle window — the name and all figures. BE CAREFUL WITH THIS ONE!

SCROLL — used as above to get the proper name on the top line to work on.

DONE — returns to the main menu.

#### REVIEW:

When you press ENTER with the cursor on REVIEW, you see an up-to-date total of all accounts in the file — total dollar amounts by month, BUDGET and ACTUAL. Pressing ENTER in response to the prompt PRESS ENTER TO CONTINUE returns you to the main menu.

#### GRAPH:

This option calls up the following choices:

ALL: prints out a bar graph of the status of each month's BUDGET vs. ACTUAL totals. Note the flashing cursors showing BUDGET is the blue bar and ACTUAL is the yellow for each month. Pressing the Y (for "yes") key in response to the COPY? prompt allows you to print the graph, if you have a printer connected. Pressing any other key gives you the prompt PRESS ENTER TO CONTINUE; you return to the GRAPH menu.

INDIVIDUAL: prints a similar graph, but only for the account whose name is on the top line. You'll have the option to COPY after the graph is printed, as above.

**SCROLL:** again, allows you to use the 6 and 7 keys to change the account whose name is in the middle window and whose totals are shown in the bottom window.

**DONE:** returns to the main menu.

#### **DONE:**

Pressing ENTER with the cursor on DONE in the main menu stops the program. If this is done by mistake, you can restart it by pressing GOTO 500. Normally you use this option after using the SAVE option.

#### **LOADING INSTRUCTIONS:**

(See Chapter 4 of your instruction manual for detailed instructions.)

1. First listen to the tape so you will be familiar with its distinct sections. The tape has a period of silence at the beginning, followed by a high-pitched, screechy noise. This is the computer program. The program is recorded twice on the cassette in case one does not load.

2. Set the volume control on the cassette deck to about 3/4 of the maximum. If you have tone controls, set the bass to minimum and treble to maximum. If you have just one tone control, set it to HIGH or MAXIMUM.

3. Rewind the tape to the beginning. Connect the EAR jack on the computer to the EAR jack on the cassette deck recorder. Make sure the plugs are clean and securely in place.

4. To instruct the computer to accept the program you must press the LOAD command and type the name of the program in quotation marks. See the instructions or cassette for the correct loading name.

5. Start the cassette deck, allow a few seconds for it to get up to speed, then press ENTER during the silence before the program begins.

6. The border of the TV screen will alternate between pale blue (cyan) and red, during the time the computer is searching for the program on the tape.

7. When the program has been found, the screen border will show a pattern of lines in the same shades of blue and red, and shortly the name of the program will appear on the screen.

8. Next, as the program itself is being loaded into the computer, the border pattern will become thinner, faster moving yellow and dark blue lines.

9. When the computer has finished loading the program, one of two things will happen:

1. Most commercial programs will begin running automatically, usually with a "title screen" or instructions to the user. (A title screen may tell you that the tape is still loading, if not, you should stop the tape immediately at this point so as to be in the proper position to load the next program if you wish.) or

2. The screen will be blank, except for a 0 OK, 0:1 in the lower left hand corner. This is a *report code* and means that the computer has successfully loaded the program.

Stop the tape immediately. To execute the program, you press RUN and ENTER. This will start the program.

#### **SOME SUGGESTIONS**

1. The volume at which the program is loaded is very important. Usually 3/4 maximum volume works best, but recorders vary and may require experimentation with the volume setting. If you have a technical background you

can check the output level of your recorder's EAR/SPKR jack. It must be at least 4-volts peak-to-peak, although 5 to 6-volts peak-to-peak is best.

2. Clean and demagnetize the heads of the tape recorder. Your ears may not pick up the signal fluctuations due to magnetic flux on the tape heads, but the computer has a much more sensitive "ear."

3. The computer is very susceptible to outside interference. Working on a metal table or near electrical appliances should be avoided.

4. Occasionally, once a program has loaded, the video display will show instability. This can be corrected by adjusting the vertical hold on the television.

#### **WARRANTY**

There are no warranties which extend beyond the description on the face hereof. No other warranty, whether express or implied, including the warranty of merchantability, shall exist in connection with the sale of this product. In no event shall Timex be liable for any consequential, incidental or special damages.

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